



**TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

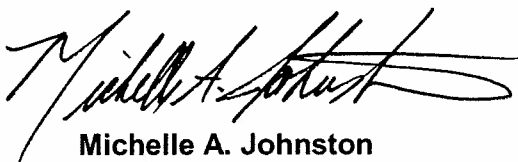
**ANALYTICAL REPORT**

**Perfluorocarbon (PFC) Analysis**

**Lot #: D9K130510**

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**Dalton Utilities  
1200 V.D. Parrot Jr. Parkway  
Dalton, GA 30721**



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Project Manager**

**January 14, 2010**

## Case Narrative

### D9K130510

TestAmerica Denver utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the methods summary page in accordance with the methods indicated. Dilution factors and footnotes are provided on each datasheet to assist in the interpretation of the results.

The results relate only to the samples in this report and meet all requirements of NELAC. All data have been reviewed for compliance with the laboratory QA/QC plan and have found to be compliant with laboratory protocols with any exceptions noted below.

Please note that Non-Detect (ND) results have been evaluated down to the Method Detection Limit (MDL) and should be considered ND at the MDL. Unless otherwise noted, results for solids have been dry weight corrected.

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#### **Sample Arrival and Receipt**

The following report contains the analytical results for two samples received at TestAmerica Denver on November 13, 2009, according to documented sample acceptance procedures. The samples were received in good condition at a temperature of 2.3°C.

Samples DUP were logged with the same collection date as the other sample listed on the chain-of-custody. The client was notified on November 13, 2009.

No other anomalies were encountered during sample receipt.

#### **Standards**

Analytical standards were prepared using commercially available certified solutions containing all compounds of interest.

The mass labeled compounds 13C4 PFBA, 13C2 PFHxA, 18O2 PFHxS, 13C4 PFOA, 13C4 PFOS, 13C5 PFNA, 13C2 PFDA, 13C2 PFUnA, 13C2 PFDoA, and D3 MeFOSA were introduced at the extraction step and were used for internal standards for the quantitation of the target compounds.

#### **Sample Extraction and Analysis**

The samples presented in this report were extracted for the target analytes by TestAmerica Denver's Standard Operating Procedure (SOP) DV-OP-0019 and analyzed for the target analytes by TestAmerica Denver's SOP DV-LC-0012.

#### **Method QC Samples**

The Method Blank is processed reagent water spiked with internal standard and prepared with each batch of 20 samples of the same matrix. The method blanks were non-detect at the reporting limits for the target analytes.

Each batch is prepared with low and mid level Laboratory Control Samples (LCS). The LCS recoveries for both levels were within established control limits, with the exception of the items noted in section Analytical Comments.

### **Analytical Comments**

The Standard Operating Procedure (SOP) was altered slightly in the sample preparation for FOSA. Sodium hydroxide was added to both samples to obtain a pH of 14 instead of the SOP required <2. The basic pH is generating better internal standard recoveries for MeFOSA.

Due to a limitation in the LIMS system, the low-level LCS associated with QC batch 9320505 reported the percent recoveries for two PFCs as 0.0%. These compounds were recovered within the control limits, as outlined below.

Compound	Low-Level LCS Actual Recovery	Control Limits	Low-Level LCS Actual Result	MDL
PFTriA	71%	44-164%	0.0142 ug/L	0.01772 ug/L
PFTeA	67%	47-172%	0.0134 ug/L	0.01456 ug/L

As the compounds were detected below the Method Detection Limits (MDL), the system reports the percent recoveries as 0.0%.

The mid-level LCS/LCSD and low-level LCS associated with QC batch 9320512 exhibited percent recoveries above the QC control limits for Perfluorooctane sulfonamide (FOSA). This is an indicator that data may be biased high. As no detectable concentrations are present in the associated samples, corrective action is deemed unnecessary.

The method required MS/MSD could not be performed for QC batches 9320505 and 9320512, due to insufficient sample volume. Method precision and accuracy have been verified by the acceptable low-level LCS and mid-level LCS/LCSD analyses data.

The closing Continuing Calibration Verification (CCV) standard associated with samples in QC batch 9320512, exhibited a %D value out of range, biased high, for Perfluorooctane sulfonamide (FOSA). This is an indicator that data may be biased high. As no detectable concentrations are present in the associated samples, corrective action is deemed unnecessary.

The Standard Operating Procedure (SOP) was altered slightly for these samples in the sample prep and LC conditions. The alterations are listed below.

Solvents are now the same as they were in the original SOP and run per the following gradient: From 0 to 11 minutes, the flow rate is 0.4 mL/minute and the MeOH ramps up from 25% to 100%. From 11 to 11.01 minutes, the flow rate increases to 0.7 mL/minute and this flow is diverted from the MS. At 13 minutes the flow rate decreases back down to 0.4 mL/minute and 25% MeOH. The column then equilibrates to 14 minutes.

PFTriA and PFTeA now use 13C2 PFUnA as their internal standard instead of 13C2 PFDoA.

No other anomalies were observed.

## EXECUTIVE SUMMARY - Detection Highlights

D9K130510

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
NO DETECTABLE PARAMETERS				

## METHODS SUMMARY

D9K130510

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
LC/MS/MS PFCs	DEN -LC-0012	SW846 FOSA spec

### References:

DEN      Severn Trent Laboratores, Denver, Facility Standard  
Operating Procedure.

## METHOD / ANALYST SUMMARY

D9K130510

<u>ANALYTICAL METHOD</u>	<u>ANALYST</u>	<u>ANALYST ID</u>
DEN -LC-0012	Jacqueline Bonnett	003601

### References:

DEN      Severn Trent Laboratores, Denver, Facility Standard  
Operating Procedure.

## SAMPLE SUMMARY

D9K130510

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
LPE9R	001	130 1018 COUNTY RD 50	11/12/09	15:11
LPE90	002	DUP	11/12/09	

### NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Dalton Utilities

Client Sample ID: 130 1018 COUNTY RD 50

HPLC

Lot-Sample #....: D9K130510-001 Work Order #....: LPE9R1AA Matrix.....: WATER  
 Date Sampled....: 11/12/09 15:11 Date Received...: 11/13/09  
 Prep Date.....: 11/16/09 Analysis Date...: 12/05/09  
 Prep Batch #....: 9320505 Analysis Time...: 01:48  
 Dilution Factor: 1

Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctanoic Acid	ND	0.020	ug/L	0.0098
Perfluorooctanesulfonate	ND	0.020	ug/L	0.013

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
13C4 PFOA	91	(60 - 155)
13C4 PFOS	54	(45 - 130)



**Dalton Utilities**

**Client Sample ID: 130 1018 COUNTY RD 50**

**HPLC**

**Lot-Sample #....:** D9K130510-001    **Work Order #....:** LPE9R2AA    **Matrix.....:** WATER  
**Date Sampled....:** 11/12/09 15:11    **Date Received...:** 11/13/09  
**Prep Date.....:** 11/16/09    **Analysis Date...:** 12/23/09  
**Prep Batch #....:** 9320505    **Analysis Time...:** 23:12  
**Dilution Factor:** 1  
**Method.....:** DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluoropentanoic acid (PFPA)	ND	0.030	ug/L	0.011
Perfluorohexanoic acid (PFHxA)	ND	0.020	ug/L	0.0029
Perfluoroheptanoic acid (PFHpA)	ND	0.020	ug/L	0.013
)				
Perfluorononanoic acid (PFNA)	ND	0.020	ug/L	0.017
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUnA)	ND	0.020	ug/L	0.0069
A)				
Perfluorododecanoic acid (PFDoA)	ND	0.020	ug/L	0.015
A)				
Perfluorotridecanoic acid (PFTriA)	ND	0.020	ug/L	0.018
Perfluorotetradecanoic acid (PFTeA)	ND	0.020	ug/L	0.015
Perfluorobutane sulfonate (PFBS)	ND	0.020	ug/L	0.0082
Perfluorohexane sulfonate (PFHxS)	ND	0.030	ug/L	0.0070

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	111	(60 - 155)
13C4 PFOS	76	(45 - 130)
13C4 PFBA	108	(36 - 130)
13C2 PFHxA	115	(55 - 135)
18O2 PFHxS	108	(61 - 130)
13C5 PFNA	84	(54 - 132)
13C2 PFDA	64	(53 - 130)
13C2 PFUnA	55	(37 - 130)
13C2 PFDoA	48	(26 - 130)

Dalton Utilities

Client Sample ID: 130 1018 COUNTY RD 50

HPLC

Lot-Sample #....: D9K130510-001    Work Order #....: LPE9R1AD    Matrix.....: WATER  
Date Sampled....: 11/12/09 15:11    Date Received...: 11/13/09  
Prep Date.....: 11/16/09    Analysis Date...: 12/01/09  
Prep Batch #....: 9320512    Analysis Time...: 16:16  
Dilution Factor: 1    Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctane sulfonamide (F OSA)	ND	0.050	ug/L	0.0057

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
MeFOSA	48	(37 - 130)

Dalton Utilities

Client Sample ID: DUP

HPLC

Lot-Sample #....: D9K130510-002    Work Order #....: LPE901AA    Matrix.....: WATER  
 Date Sampled....: 11/12/09    Date Received...: 11/13/09  
 Prep Date.....: 11/16/09    Analysis Date...: 12/05/09  
 Prep Batch #....: 9320505    Analysis Time...: 01:58  
 Dilution Factor: 1  
 Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Perfluorooctanoic Acid	ND	0.020	ug/L	0.0098
Perfluorooctanesulfonate	ND	0.020	ug/L	0.013

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	91	(60 - 155)
13C4 PFOS	60	(45 - 130)

Dalton Utilities

Client Sample ID: DUP

HPLC

Lot-Sample #....: D9K130510-002    Work Order #....: LPE902AA    Matrix.....: WATER  
 Date Sampled....: 11/12/09    Date Received...: 11/13/09  
 Prep Date.....: 11/16/09    Analysis Date...: 12/23/09  
 Prep Batch #....: 9320505    Analysis Time...: 23:27  
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluoropentanoic acid (PFPA)	ND	0.030	ug/L	0.011
Perfluorohexanoic acid (PFHxA)	ND	0.020	ug/L	0.0029
Perfluoroheptanoic acid (PFHpA)	ND	0.020	ug/L	0.013
)				
Perfluorononanoic acid (PFNA)	ND	0.020	ug/L	0.017
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUnA)	ND	0.020	ug/L	0.0069
A)				
Perfluorododecanoic acid (PFDoA)	ND	0.020	ug/L	0.015
A)				
Perfluorotridecanoic acid (PFTriA)	ND	0.020	ug/L	0.018
Perfluorotetradecanoic acid (PFTeA)	ND	0.020	ug/L	0.015
Perfluorobutane sulfonate (PFBS)	ND	0.020	ug/L	0.0082
Perfluorohexane sulfonate (PFHxS)	ND	0.030	ug/L	0.0070

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	99	(60 - 155)
13C4 PFOS	81	(45 - 130)
13C4 PFBA	104	(36 - 130)
13C2 PFHxA	109	(55 - 135)
18O2 PFHxS	100	(61 - 130)
13C5 PFNA	91	(54 - 132)
13C2 PFDA	73	(53 - 130)
13C2 PFUnA	61	(37 - 130)
13C2 PFDoA	48	(26 - 130)

Dalton Utilities

Client Sample ID: DUP

HPLC

Lot-Sample #....: D9K130510-002    Work Order #....: LPE901AC    Matrix.....: WATER  
 Date Sampled....: 11/12/09    Date Received...: 11/13/09  
 Prep Date.....: 11/16/09    Analysis Date...: 12/01/09  
 Prep Batch #....: 9320512    Analysis Time...: 16:21  
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Perfluorooctane sulfonamide (F OSA)	ND	0.050	ug/L	0.0057

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
MeFOSA	48	(37 - 130)

# QC DATA ASSOCIATION SUMMARY

D9K130510

## Sample Preparation and Analysis Control Numbers

<u>SAMPLE#</u>	<u>MATRIX</u>	<u>ANALYTICAL METHOD</u>	<u>LEACH BATCH #</u>	<u>PREP BATCH #</u>	<u>MS RUN#</u>
001	WATER	DEN -LC-0012		9320505	
	WATER	DEN -LC-0012		9320512	
002	WATER	DEN -LC-0012		9320505	
	WATER	DEN -LC-0012		9320512	